

IN THE CLAIMS:

Please amend the claims of this application so as to read as follows:

1. (Currently Amended) An image correction apparatus for correcting an image of a document with a binding portion lifted differently between the top and the bottom of the document, comprising:
 - edge detection means for detecting edges of the document;
 - binding position detection means for obtaining a binding position of the document;
 - reference line detection means for obtaining a reference line for the position of the document;
 - side slope angle computing means for computing slope angles of the top and bottom sides of the document on the basis of the reference line and the binding position;
 - three-dimensional edge position computing means for computing three-dimensional positions of upper and lower edges of the document on the basis of the edges and the slope angles;
 - and
 - document shape computing means for computing a shape of a whole of the document on the basis of the three-dimensional positions of the edges

~~image input means;~~
~~storage means;~~
~~central processing means; and~~
~~image output means;~~
~~the image correction apparatus comprising:~~
 - ~~side slope image correction means for correcting an image of a document whose top and bottom sides make a slope with respect to a document platen.~~

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2. (Currently Amended) The image correcting apparatus of claim 1, further comprising wherein the side sloping image correction means includes ~~edge detection means for detecting edges of the document; binding position detection means for obtaining a binding position of the document; reference line detection means for obtaining a reference line for the position of the document; document end point detection means for obtaining left and right end points of the document on the basis of variations in image luminance near the edges; and side slope angle computing means for computing slope angles of the top and bottom sides of the document on the basis of the reference line and the binding position; three-dimensional edge position computing means for computing three-dimensional positions of upper and lower edges of the document on the basis of the edges and the slope angles; document shape computing means for computing a shape of a whole of the document on the basis of the three-dimensional positions of the edges; and luminance correction parameter computing means for obtaining background luminance of a correction target pixel from the image on the basis of the three-dimensional shape of the document and obtaining a luminance correction parameter for the pixel on the basis of the background luminance and target luminance, and wherein an input image is corrected using the luminance correction parameter and the three-dimensional shape of the document.~~
3. (Currently Amended) The image correction apparatus of claim 2 1, wherein, from an area where a change of edge position is small, the edge detection means detects segments longer than a predetermined length and, for any other portion than the detected segments, a position interpolated from segments detected before and after that portion is taken as a position of a document edge.

4. (Currently amended) The image correction apparatus of claim 21, wherein, of maximum or minimum points of positions of edges detected by the edge detection means, the binding position detection means detects those nearest to a center of the image as representing the binding position.
5. (Currently Amended) The image correction apparatus of claim 21, wherein, of segments where a pixel value of an image near each edge is larger than a first reference value and where an amount of change of edge slope is smaller than a second reference value, the reference line detection means detects an average edge slope in the longest segment as a slope of the reference line, and takes a straight line, extended from an end point outside the document along the longest segment with the thus detected slope, as the reference line, the reference line being detected for each of the left and right edges or the upper and lower edges of the document.
6. (Currently Amended) The image correction apparatus of claim 21, wherein the document end point detection means detects the end points of the document, based on different criteria between left and right pages of the document.
7. (Currently Amended) The image correction apparatus of claim 21, wherein the document shape computing means approximates a document surface by a set of straight lines connecting between the lower and upper edges, and obtains a three-dimensional position of the document surface on the basis of a dividing ratio in which the positions of the upper and lower end points of the straight lines are divided.

8. (Currently Amended) The image correction apparatus of claim ~~2~~ 1, wherein, when computed edge lengths of the upper and lower edges differ from each other, the document shape computing means corrects the three-dimensional positions of the edges so that the lengths ~~becomes~~ become equal to each other.
9. (Currently Amended) The image correction apparatus of claim ~~7 or 9~~ 1, wherein, when computed vertical lengths of the left and right pages differ from each other, the document shape computing means corrects three-dimensional shape data of the document so that the vertical lengths ~~becomes~~ become equal to each other.
10. (Currently Amended) The image correction apparatus of ~~any one of claims 2 and 7 to 9~~ claim 1, wherein, the document shape computing means includes image reducing means for reducing an input image in accordance with a predetermined reduction ratio and, after obtaining the three-dimensional shape of the document from a reduced image, corrects the three-dimensional shape data of the document in accordance with the reduction ratio.
11. (Currently Amended) The image correction apparatus of claim ~~1 or 2~~ 7, wherein ~~the~~ a luminance correction parameter computing means obtains ~~the~~ a background luminance of ~~the~~ a correction target pixel on the basis of a dividing ratio of an image luminance near ~~the~~ the upper and lower points of ~~the~~ the straight lines of ~~claim 7~~ which are used to approximate the document surface, and takes the ratio of a target luminance to the background luminance as a luminance correction parameter.

12. (Currently Amended) The image correction apparatus of ~~any one of claims 1;~~
~~2 and 4~~ claim 1, wherein ~~the side-sloping image correction means~~
~~converts~~ a pixel value near the binding position is converted to blank
space, and ~~outputs~~ a converted pixel value is outputted to the image
output means.

13. (Currently Amended) The image correction apparatus of ~~any one of claims 1;~~
~~2 and 4~~ claim 1, wherein ~~the side-sloping image correction means~~
~~converts~~ a pixel near the binding position is converted to a pixel value
at a position distanced from the binding position, and ~~outputs~~ a
converted pixel value is outputted to the image output means.

14. (Currently Amended) The image correction apparatus of ~~claim 2 or 10~~ 1,
wherein ~~the side-sloping image correction means performs~~ image
reading for producing the a reduced image is performed separately
from image reading for reading the a correction target pixel.

15. (Currently Amended) The image correction apparatus of ~~any one of claims 1~~
~~to 14~~ claim 1, further comprising:
correction selecting means for making a selection as to
whether image correction is applied or not; and
~~wherein~~ image input means for inputting an image by using
input characteristics which vary depending upon
whether image correction is carried out or not.

16. (Currently Amended) The image correcting apparatus of ~~any one of claims 1 to 15~~ claim 1, further comprising:

document region detection means for detecting a document region
from an input image,
wherein when the document region runs over the image, image
correction is not carried out.